

LIGHTED SUPPORT POLE AND BANNER5 CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of the filing of U.S. Provisional Patent Application Serial No. 60/395,742, entitled "Luminescent Support Pole," filed on July 12, 2002, and the specification thereof is incorporated herein by reference.

10 BACKGROUND OF THE INVENTIONField of the Invention (Technical Field):

The present invention relates generally to support poles, and more particularly, but not necessarily entirely, to a lighted support pole for illuminating and hanging a banner.

15 Background Art:

Note that the following discussion refers to a number of publications by author(s) and year of publication, and that due to recent publication dates certain publications are not to be considered as prior art vis-a-vis the present invention. Discussion of such publications herein is given for more complete background of the scientific principles and is not to be construed as an admission that such publications
20 are prior art for patentability determination purposes.

Proper flag displaying etiquette requires a flag to be properly displayed during both daytime and nighttime hours. There are several different types of flags that have become increasingly popular to display, such as national flags, advertising and organizational flags, as well as pennants flying on
25 flagpoles. Typically, these flags are poorly lit or not visible during nighttime hours, violating proper flag etiquette. Proper flag etiquette requires that flags and pennants be visible at any time of the day or night and at any time of the year.

In fact, at one point the United States of America codified the manner in which the flag of the United States should be treated in what was known as the "Flag Code," 36 U.S.C. § 173-178. The following is an example of what was contained therein.

5 "Display on buildings and stationary flagstaffs in open; night display: It is the universal custom to display the flag only from sunrise to sunset on buildings and on stationary flagstaffs in the open. However, when a patriotic effect is desired, the flag may be displayed twenty-four hours a day if properly illuminated during the hours of darkness." (36 U.S.C. § 174)

10 Various solutions to improve the visibility of flags and pennants at night are known in the art. The most widely recognized solution makes use of floodlights to improve the visibility of such flags. However, depending on the voltage range used, floodlights are often difficult to install and the investment of properly illuminating the flag and the subsequent costs of operating floodlights can be very expensive.

15 Accordingly, the prior art contains various solutions relating to flagpole lighting and properly illuminating flags and pennants. For example, U.S. Patent No. 6,227,603 (issued May 8, 2001 to Tukia) discloses a flagpole light in the form of a luminous knob comprising a light source having a cover and emits light rays that are reflected from reflecting surfaces through a translucent lower portion of the cover for mounting on existing flagpoles or during manufacturing. However, this lighting system is
20 disadvantageous because it does not adequately light the flag and does not illuminate the pole upon which the flag or pennant may be attached. Therefore, this invention is unable to adequately illuminate both the flag and the pole.

 U.S. Patent No. 3,476,929 (issued November 4, 1969 to Klinger) discloses a hollow tubular metal
25 mast having a ground penetrating point at its lower end and a reflector cone, including lenses and a light source, at its top end for illuminating a pennant flying at the top of the mast. This invention is disadvantageous because the metal mast is not transparent and does not allow light to pass therethrough, making it impossible to illuminate the pole.

U.S. Patent No. 1,878,447 (issued September 20, 1932 to Sutphen) discloses a flagpole comprising a translucent material and lights, but this invention illuminates only the top portion of the pole.

U.S. Patent No. 4,598,339 (issued July 1, 1986 to Ainsworth) discloses a transparent tubular pole with lights and circuit board which serves as a safety light for a bicycle. This invention is disadvantageous because it does not support a flag, the entire pole structure is not illuminated, and the lights would not adequately illuminate a flag if one were added.

It is noteworthy that none of the prior art known to applicant provides a lighted pole and banner assembly capable of illuminating both the flag, or pennant, and the entire pole upon which the flag is attached. There is a long felt, but unmet need, for a lighted pole and banner assembly that is relatively inexpensive to make, simple in operation and which illuminates both the pole and the flag for nighttime display.

The prior art is thus characterized by several disadvantages that are addressed by the present invention. The present invention minimizes, and in some aspects eliminates, the above-mentioned failures, and other problems, by utilizing the methods and structural features described herein.

SUMMARY OF THE INVENTION (DISCLOSURE OF THE INVENTION)

The present invention is a lighted pole and banner assembly comprising an elongated support, such as a flagpole, a banner such as a flag, banner, or pennant, and a light source that illuminates both the banner and at least portions of the support substantially along the length of the support. The support may be wholly or partially translucent or transparent, and include areas of differing colors and translucencies. The light source may be situated inside the support or on its surface, and may extend along the entire length of the support.

The light source may include multiple lighting elements, which might be turned on and off independently and might vary in color and brightness. Such elements may include incandescent filaments, rope lights, fluorescent lights, neon gas bulbs, filament lamps, spring lamps, tube lamps, light

emitting diodes, fiber optic lights, and the like. The operation of the light source may be controlled by a programmable controller, a timer, a photocell, or a combination thereof. The light source may be powered by current from a power grid, a transformer, a generator, a battery, a 12 volt adaptor such as a vehicle cigarette lighter, or a solar cell. The battery may be rechargeable, optionally by a solar cell.

5

The invention is further a luminescent support pole mounted to a transportation vehicle, such as an automobile, van, truck, motor home, motorcycle, or bicycle.

The invention is also a method for illuminating a banner comprising the steps of attaching a
10 banner to an elongated support and illuminating the banner and at least one portion substantially along the support with an light source. The support may be wholly or partially translucent. The light source may be placed within the support. The color and intensity of the illumination provided by the light source may be varied. The operation of the light source may be automatically controlled.

15 Objects, advantages and novel features, and further scope of applicability of the present invention will be set forth in part in the detailed description to follow, taken in conjunction with the accompanying drawings, and in part will become apparent to those skilled in the art upon examination of the following, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the
20 appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, which are incorporated into and form a part of the specification, illustrate several embodiments of the present invention and, together with the description, serve to explain
25 the principles of the invention. The drawings are only for the purpose of illustrating a preferred embodiment of the invention and are not to be construed as limiting the invention. In the drawings:

FIG. 1 is a side view of a lighted pole and banner assembly made in accordance with the principles of the present invention;

FIG. 1A is a side view of the lighted pole and banner assembly attached to a structure via a support bracket, made in accordance with the principles of the present invention;

5 FIG. 2 is a side, cross-sectional view of an light source of the lighted pole and banner assembly of FIG. 1, taken along section 2--2,

FIG. 3 is a cross sectional view of the light source taken along section 3--3 of FIG.1;

10 FIG. 4 is a side view of an alternative embodiment illustrating a neon-illuminated support pole that is comprised of shorter units assembled into a longer pole made in accordance with the principles of the present invention;

15 FIG. 5 is a side view of an alternative embodiment illustrating a neon-illuminated support pole made in accordance with the principles of the present invention;

FIG. 6 is a side view of another alternative embodiment illustrating a neon-illuminated support pole made in accordance with the principles of the present invention;

20 FIG. 7 is a side view of a bottom portion of the invention installed in rock or another hard material;

FIG. 8A is a detail of a spacer used in FIG. 6;

FIG. 8B is a detail of a washer used in FIG. 5;

25

FIG. 8C is a detail of a tube assembly cushion washer used in FIG. 5;

FIG. 8D is a detail of a seating cushion used in FIG. 5;

FIG. 8E is a detail of a cushion washer used in FIG. 4;

FIG. 8F is a detail of a coupler used in FIG. 6;

5 FIG. 9 is an alternative embodiment of the invention utilizing a tube lamp; and

FIG 10 is an alternative embodiment of the invention utilizing a spring lamp.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

10 (BEST MODES FOR CARRYING OUT THE INVENTION)

A nation's flag or any other type of flag may be properly displayed during nighttime hours by illuminating the flag using a clear light transparent support pole that may be internally illuminated, thus illuminating and displaying the flag in an appropriate manner. The present invention is a unique, novel support pole that may be advantageously used both during the day and at night without the necessity of
15 taking down the flag during nighttime hours due to improper display as required by proper flag etiquette. The present invention is a lighted pole and banner assembly that optionally may be easily attached to a structure to support any type of flag.

As used throughout the specification and claims, the term "banner" means flag, pennant, ensign,
20 banner, insignia, and the like, including any other object that may be displayed on a pole.

As used throughout the specification and claims, the term "support" means pole, flagpole, beam, wand, arm, stick, and the like.

25 As used throughout the specification and claims, the term "light source" means incandescent filament, rope light, fluorescent light, neon gas bulb, filament lamp, spring lamp, tube lamp, light emitting diode, fiber optic light, and the like.

Referring now to FIGS. 1 and 1A, wherein lighted pole and banner assembly, generally referred to as **100**, is illustrated, comprising support **110**, light source **120**, conductor **130**, connector **140**, cap **150** and banner **200**. Support **110** may be illuminated at night such that proper flag displaying etiquette may be closely observed. The following structural features of support **110** may advantageously be associated with the novel function of illuminating lighted pole and banner assembly **100**. It should be noted that support **110** may be manufactured from a clear acrylic, other transparent materials, luminescent materials, or translucent materials such that light may pass therethrough illuminating, fully or at least partially, support **110**. In addition, support **110** may have non-uniform light transmitting characteristics. Such non-uniform characteristics may be inherent to the material support **110** is constructed of, or may be imparted to support **110** by partially covering it, painting it, or otherwise modifying or decorating it. For example, support **110** may be completely transparent; alternatively it may be opaque at the bottom, translucent in the middle, and transparent at the top adjacent to the flag, optionally, support **110** may be opaque everywhere except for the side of the pole to which the flag is attached, where it may be transparent. Another embodiment provides for support **110** to be substantially opaque except for a transparent or translucent design, such as stars or other shapes, integrated into support **110**. Optionally, support **110** may be translucent and colored, with a single uniform color, multiple colors, or colored designs. As can be appreciated by those skilled in the art, the present invention includes any combination of varying sections, degrees of transparency or translucency, colors, design features, etc.

Additionally, support **110** may be configured as a hollow tube for receiving light source **120** therein and may be dimensioned according to the size, including the length and dimension, of light source **120**. For example, the wall thickness of support **110** may lie within the range of about 1 mm to about 15 mm without departing from the scope of the present invention. It should be noted that any wall thickness may be utilized in the present invention and may be readily determined by one of skill in the art depending upon the desired length and diameter of support **110** to be manufactured.

Additionally, support **110** may be manufactured in various lengths and diameters, some examples of which have been reproduced below in a table for convenience. It should be noted, however, that the

dimensions listed below are in no way intended to limit the scope of the present invention and have been provided herein for enablement purposes.

LENGTH OF SUPPORT	DIAMETER OF SUPPORT
1 ½ feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
2 feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
2 ½ feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
3 feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
3 ½ feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
4 feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
4 ½ feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
5 feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
5 ½ feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches
6 feet	½ inch, 1 ½ inches, 1 3/8 inches, 2 inches, 2 ½ inches, and 3 inches

As shown in the drawings, support **110** preferably comprises first end **112** and second end **114**.

The first end **112** of support **110** may optionally be equipped with cap **150** for decoratively finishing support **110** for a more impressive appearance. Cap **150** not only serves the function of providing an impressive finished appearance, but also acts as a barrier such that light source **120** may not escape from support **110** and to protect light source **120** from the weather. It should be noted that cap **150** may be manufactured from materials known in the art to provide a finished appearance and that acts as a barrier. Examples of such materials include, but are not limited to, polymers, such as plastic, vinyl, or rubber, and metallic materials such as brass, spun aluminum, gold, silver, chrome, or any other metal or metal alloys, and the like.

Referring generally to FIG. 1 and 1A, light source **120** may be configured to be located within the hollow portion of support **110**. Light source **120** may enter support **110** through second end **114** and may be secured thereto by a means for securing light source **120** within support **110**. Light source **120** may

be comprise first end **122** and second end **124** with a plurality of incandescent filaments **126** disposed therebetween. First end **122** comprises a coupler configured for coupling light source **120** to conductor **130**, while second end **124** comprises a point of termination, where incandescent filaments **126** of light source **120** conclude.

5

Referring specifically to FIG. 2, wherein an enlarged side cross-sectional view of the light source of FIG. 1 is illustrated, incandescent filaments **126** may be part of an intricate electrical system providing a source of illumination when a current is conducted therethrough. FIG. 3 is a cross-sectional view taken along the line 3-3 of FIG. 1, and illustrates incandescent filament **126** as part of light source **120** in relation to support **110**. It should be noted that incandescent filament **126** is only one illustrative embodiment of structure that provides the illumination emanating from light source **120**. It should be noted that other light sources are contemplated by the present invention, including but not limited to fluorescent lights, neon gas lights, filament lamps, light emitting diodes (commonly known as "LED's"), fiber optics, as well as other devices known, or which may become known in the future, in the art to emit energy creating illumination.

15

One embodiment of light source **120** of the present invention comprises a rope light configured for maintaining the above described incandescent filament **126** or other device known to emit energy creating illumination. Rope light is known in the art to be flexible and adaptable. It will be appreciated by those of skill in the art that several structural components may be used to increase the flexibility and adaptability of the rope light, such as a connector for connecting two cut pieces of rope lighting, rope light controllers, rope light track, splicing pieces, clips, transformers, rope light extensions, as well as other components familiar to one of skill in the art. It should be noted that light source **120** may be a rope light as illustrated, a neon light assembly (illustrated in FIGS. 8-19) or any other device configured for maintaining the above-described structural features that emit energy creating illumination.

20

25

Additionally, light source **120** may be configured in a variety of colors to match the colors of banner **200** used. For example, a United States flag may have red lights, white lights, and blue lights such that light source **120** illuminates all three colors. Light source **120** may illuminate only a single color

or it may illuminate a combination of several colors depending upon the desired affect. Colors of light source **120** may be created using either colored incandescent filaments **126** or light source **120** itself maybe colored. Colors of incandescent filaments **126** include, but are not necessarily limited to, clear, red, yellow, green, amber, blue, and purple, while colors of light source **120** include, but are not necessarily limited to, clear (white), red, yellow, green, amber, blue, purple, fluorescent green, fluorescent orange, and fluorescent pink.

In addition, the brightness of light source **120** may vary according to the height along support **110** or direction relative to banner **200**. For example, the illumination may be stronger adjacent to the banner.

Optionally the brightness and the colors may be varied as desired, by dimming or turning on and off various lighting elements or sections of light source **120** as required to obtain the desired effect. This may be achieved by utilizing a programmable control apparatus. For example, light source **120** may blink on and off, optionally with each succeeding blink being a different color. In another embodiment, different heights or sections of light source **120** may be darkened or illuminated sequentially in a desired pattern. In yet another embodiment messages may be displayed by illuminating LED's as desired.

It should likewise be noted that light source **120** may be located within support **110**, but one of skill in art may modify support **110** to receive light source **120** on any portion of support **110** without departing from the scope of the present invention. For example, support **110** may have light source **120** integrally formed within support **110**, or may have light source **120** secured to the outer portion of support **110**. For example, a lighting element may be attached along the length of, or spiraled around the outside of, a pole. This last embodiment allows for retrofitting a lighting element contemplated herein to an existing pole.

Referring back to FIGS. 1 and 1A, second end **114** of support **110** may be configured to receive connector, generally referred to as **140**, that maintains light source **120** within support **110** and couples conductor **130** with light source **120**. Connector **140** may be configured and dimensioned to fit either inside of second end **114** of support **110** or it may fit outside of second end **114** such that connector **140**

essentially wraps around said second end **114**. As illustrated in FIGS. 1 and 1A, connector **140** may comprise first cylindrically shaped portion **142** and second cylindrically shaped portion **144**.

As illustrated, first portion **142** may be larger in size than second portion **144**. However, it should be noted that first portion **142** may be smaller than second portion **144**, or first portion **142** and second portion **144** may be equal in size. Additionally, connector **140** may be manufactured from a clear acrylic, plastic, or other polymeric material. It should be further noted that connector **140** may be shaped in a plurality of different shapes without departing from the scope of the present invention, and one of skill in the art may modify connector **140** to be of any suitable shape. For example, connector **140** may be circular or cylindrical (as illustrated), square, any polygonal shape, or any other suitable shape for coupling conductor **130** to light source **120** and maintaining light source **120** within support **110**. It will be appreciated that the structure disclosed herein for connector **140** may be two distinct portions as illustrated, or it may be a single unit, or it may be multiple parts. One of skill in the art may modify the connector to accommodate various sized supports **110** and any such modification of connector **140** is contemplated by the present invention.

As illustrated in FIGS. 1 and 1A, conductor **130** functions to provide power via an electric current to light source **120** and specifically conducting electric current to the coupler of first end **122** of the light source **120**. As illustrated, conductor **130** may comprise plug **132** and power cord **134**. Plug **132** may be configured and dimensioned to fit into any electrical outlet, such as a standard 110 volt electrical outlet commonly used in the United States, or a standard 220 volt electrical outlet commonly used outside of the United States. Plug **132** connects to power cord **134** and allows the conduction of the electrical current from electrical outlet **300**, or other electrical source, to light source **120** in an amount sufficient to cause light source **120** to react and illuminate.

Conductor **130** has been illustrated herein as one that conducts electrical current via electrical plug **132** and power cord **134**. It should be noted that power source **300** of the current may be an electrical outlet, an illustrated in FIGS. 1 and 1A, a battery (not illustrated), a transformer, a generator, a solar cell, or any other source capable of producing enough current at a suitable voltage to illuminate light

source **120**. The battery may be a replaceable or rechargeable, optionally being recharged by a solar cell during daylight hours. The power source may optionally be connected to a timer or a photocell so that light source **120** is, for example, turned on automatically at dusk and turned off automatically at dawn. It should be noted that one of skill in the art may modify conductor **130** to correspond with the appropriate power source **300** and conductor **130** may be modified as power source **300** is modified. For example, by changing power source **300** from a standard electrical outlet to a battery, conductor **130** will likewise need to be modified to connect the battery thereby creating a conduit for the conduction of current from power source **300** to light source **120**.

Also illustrated in FIG. 1A, is support bracket, generally referred to as **250**. Support bracket **250** has first arm **252** and second arm **254** extending from bracket attachment **256**. Support bracket **250** may be configured and dimensioned to accept lighted pole and banner assembly **100** therein.

FIG. 4 illustrates an embodiment of the invention in which two sections of support **110** are assembled to make a longer illuminated flag pole. In this embodiment, the light source comprises neon lights **410**, transformer **420** within the pole **110**, AC power cable **440**, wire **450** connecting the bottom of neon light **410** to transformer **420**, cushion washer **430** to center neon bulb and wires **440** and **450**, and set screws **460** to hold the assembly together. Cushion washer **430** preferably comprises black foam elastomer and is detailed in FIG. 8E.

FIG. 5 details an alternate method of disposing a neon lighting element inside support **110**. The neon tube assembly comprises a tube assembly comprising neon tube **410** and two parallel acrylic tubes **510** held together by series of spacers **520** (preferably comprising clear acrylic), electrical boot **530**, wire nuts **540**, washer **550** (preferably comprising black foam elastomer and detailed in FIG. 8B), tube assembly cushion washer **560** (preferably comprising black foam elastomer and detailed in FIG. 8C), and seating cushion **570** (preferably comprising black foam elastomer and detailed in FIG. 8D).

FIG. 6 illustrates another alternate embodiment of disposing a neon lighting element inside support **110**. Here support **110** comprises a tube (e.g. 3 inch diameter and preferably acrylic). Two neon

tubes **410** are connected to a rod **610** (e.g. 1/2 inch diameter, preferably threaded and preferably aluminum) by multiple spacers **620** (preferably comprising clear acrylic and detailed in FIG. 8A). The apparatus further comprises butt connectors **630**, electrical boots **530**, brass coupling nut **640**, cushion washers **430**, aluminum washer **650**, steel locknut **660**, and coupler **670** (preferably comprising aluminum and detailed in FIG. 8F).

FIG. 7 is an illustration of an example of an outdoor installation of the invention, detailing the placement of the bottom of support **110** into rock **710**. Waterproof wire **720** runs from a power source, through hole **730** in rock **710** and through support **110** up to the light source. A hole filled with material **740**, such as sand or cement, secures support **110** in place.

FIG. 8 contains details of components used in the embodiments of the invention depicted in previous figures.

FIG. 9 is an alternate embodiment of the invention wherein the light source comprises tube lamp **900**. Support **110** comprises a tube, preferably Flexglass. The tube lamp is secured within the support by attaching each end to connector **910** (preferably comprising PVC), which is then situated in coupling **920** (also preferably comprising PVC). One end of the assembly is sealed with ring **930** (e.g. Flexglass), ring **940** (e.g. rubber black), and end cap **950**. Wiring connector **960** is inserted in the other end.

The embodiment of the invention depicted in FIG.10 is similar to that in FIG. 9 except that the light source comprises spring lamp **970**, which encircles PVC tube **980**. The spring lamp may comprise different colored elements.

An alternative use contemplated by the present invention is a smaller flag or banner mounted on a car or other vehicle. The light source may be battery powered, solar powered, have a plug to be inserted into the vehicle's 12 volt adaptor or cigarette lighter, or may be powered by other means. The flag might be a sports pennant or other banner. Alternatively, automobile dealers may use the invention to draw

attention to and differentiate cars on their lot that are on sale, or the like. Blinking lights attract attention to the pole and flag/banner.

Other uses that are contemplated by the present invention include: flags mounted on hats, poles
5 with lighted animation (moving lights), Christmas lighting, belts, and an LED displaying letters spelling words.

Although the invention has been described in detail with particular reference to these preferred
embodiments, other embodiments can achieve the same results. Variations and modifications of the
10 present invention will be obvious to those skilled in the art and it is intended to cover in the appended
claims all such modifications and equivalents. The entire disclosures of all references, applications,
patents, and publications cited above are hereby incorporated by reference.